

(D) Donning, use, and inflation of individual flotation means, if applicable; and

(E) Ditching, if applicable, including but not limited to, as appropriate:

(1) Cockpit preparation and procedures;

(2) Crew coordination;

(3) Passenger briefing and cabin preparation;

(4) Donning and inflation of life preservers;

(5) Use of life-lines; and

(6) Boarding of passengers and crew into raft or a slide/raft pack.

(ii) Observe the following drills:

(A) Removal from the airplane (or training device) and inflation of each type of life raft, if applicable;

(B) Transfer of each type of slide/raft pack from one door to another;

(C) Deployment, inflation, and detachment from the airplane (or training device) of each type of slide/raft pack; and

(D) Emergency evacuation including the use of a slide.

(d) After September 1, 1993, no crewmember may serve in operations under this part unless that crewmember has performed the PBE drill and the firefighting drill described by paragraphs (c)(1)(i) and (c)(1)(ii) of this section, as part of a one-time training requirement of paragraphs (c)(1) or (c)(2) of this section as appropriate. Any crewmember who performs the PBE drill and the firefighting drill prescribed in paragraphs (c)(1)(i) and (c)(1)(ii) of this section after May 26, 1987, is deemed to be in compliance with this regulation upon presentation of information or documentation, in a form and manner acceptable to the Director, Flight Standards Service, showing that the appropriate drills have been accomplished.

(e) Crewmembers who serve in operations above 25,000 feet must receive instruction in the following:

(1) Respiration.

(2) Hypoxia.

(3) Duration of consciousness without supplemental oxygen at altitude.

(4) Gas expansion.

(5) Gas bubble formation.

(6) Physical phenomena and incidents of decompression.

(f) For the purposes of this section the following definitions apply:

(1) *Actual fire* means an ignited combustible material, in controlled conditions, of sufficient magnitude and duration to accomplish the training objectives outlined in paragraphs (c)(1)(i) and (c)(1)(ii) of this section.

(2) *Approved fire extinguisher* means a training device that has been approved by the Administrator for use in meeting the training requirements of § 121.417(c).

(3) *Approved PBE simulation device* means a training device that has been approved by the Administrator for use in meeting the training requirements of § 121.417(c).

(4) *Combats*, in this context, means to properly fight an actual or simulated fire using an appropriate type of fire extinguisher until that fire is extinguished.

(5) *Observe* means to watch without participating actively in the drill.

(6) *PBE drill* means an emergency drill in which a crewmember demonstrates the proper use of protective breathing equipment while fighting an actual or simulated fire.

(7) *Perform* means to satisfactorily accomplish a prescribed emergency drill using established procedures that stress the skill of the persons involved in the drill.

(8) *Simulated fire* means an artificial duplication of smoke or flame used to create various aircraft firefighting scenarios, such as lavatory, galley oven, and aircraft seat fires.

[Doc. No. 9509, 35 FR 90, Jan. 3, 1970]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 121.417, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and on GPO Access.

§ 121.418 Differences training: Crewmembers and dispatchers.

(a) Differences training for crewmembers and dispatchers must consist of at least the following as applicable to their assigned duties and responsibilities:

(1) Instruction in each appropriate subject or part thereof required for initial ground training in the airplane unless the Administrator finds that particular subjects are not necessary.

(2) Flight training in each appropriate maneuver or procedure required for initial flight training in the airplane unless the Administrator finds that particular maneuvers or procedures are not necessary.

(3) The number of programmed hours of ground and flight training determined by the Administrator to be necessary for the airplane, the operation, and the crewmember or aircraft dispatcher involved.

Differences training for all variations of a particular type airplane may be included in initial, transition, upgrade, and recurrent training for the airplane.

§ 121.419 Pilots and flight engineers: Initial, transition, and upgrade ground training.

(a) Initial, transition, and upgrade ground training for pilots and flight engineers must include instruction in at least the following as applicable to their assigned duties:

- (1) General subjects—
 - (i) The certificate holder's dispatch or flight release procedures;
 - (ii) Principles and methods for determining weight and balance, and runway limitations for takeoff and landing;
 - (iii) Enough meteorology to insure a practical knowledge of weather phenomena, including the principles of frontal systems, icing, fog, thunderstorms, and high altitude weather situations;
 - (iv) Air traffic control systems, procedures, and phraseology;
 - (v) Navigation and the use of navigation aids, including instrument approach procedures;
 - (vi) Normal and emergency communication procedures;
 - (vii) Visual cues prior to and during descent below DH or MDA;
 - (viii) Approved crew resource management initial training; and
 - (ix) Other instructions as necessary to ensure his competence.
- (2) For each airplane type—
 - (i) A general description;
 - (ii) Performance characteristics;
 - (iii) Engines and propellers;
 - (iv) Major components;
 - (v) Major airplane systems (i.e., flight controls, electrical, hydraulic); other systems as appropriate; prin-

ciples of normal, abnormal, and emergency operations; appropriate procedures and limitations;

(vi) Procedures for—

(A) Recognizing and avoiding severe weather situations;

(B) Escaping from severe weather situations, in case of inadvertent encounters, including low-altitude windshear, and

(C) Operating in or near thunderstorms (including best penetrating altitudes), turbulent air (including clear air turbulence), icing, hail, and other potentially hazardous meteorological conditions;

(vii) Operating limitations;

(viii) Fuel consumption and cruise control;

(ix) Flight planning;

(x) Each normal and emergency procedure; and

(xi) The approved Airplane Flight Manual.

(b) Initial ground training for pilots and flight engineers must consist of at least the following programmed hours of instruction in the required subjects specified in paragraph (a) of this section and in § 121.415(a) unless reduced under § 121.405:

(1) Group I airplanes—

(i) Reciprocating powered, 64 hours; and

(ii) Turbopropeller powered, 80 hours.

(2) Group II airplanes, 120 hours.

[Doc. No. 9509, 35 FR 90, Jan. 3, 1970, as amended by Amdt. 121-199, 53 FR 37696, Sept. 27, 1988; Amdt. 121-250, 60 FR 65949, Dec. 20, 1995]

§ 121.420 Flight navigators: Initial and transition ground training.

(a) Initial and transition ground training for flight navigators must include instruction in the subjects specified in § 121.419(a) as appropriate to his assigned duties and responsibilities and in the following with respect to the particular type airplane:

(1) Limitations on climb, cruise, and descent speeds.

(2) Each item of navigational equipment installed including appropriate radio, radar, and other electronic equipment.

(3) Airplane performance.